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DEPARTMENT OF THE NAVY

NAVAL UNDERSEA CENTER

SAN DIEGO, CALIFORNIA 92132

IN REPLY REFER TO:

4002/CSJ:ah
3 August 1973

STATINTL



A short (3 minutes) film on Shark Screen is on its way to you. I think it is self-explanatory. The scenes with the sharks were filmed in the shark pens at the Lerner Marine Laboratory, Bimini, Bahamas. The sharks are tiger sharks about nine feet long.

I am sending along a piece of the material I mentioned in our phone conversation and another shark screen package. This package contains the bottom, less floatation rings, of one of the prototypes sent to you earlier. The floatation rings are really not necessary if other floatation is carried, i.e., May West, Jayne Manesfield, MK3C, etc. A drawstring is provided to purse the bag around the user's neck. As you can see, this reduces the package size considerably. However, Sharks Screens with floatation could be made in a very small package using the new material.

If you have any questions on the film, please don't hesitate to call me.

Sincerely yours,

C. SCOTT JOHNSON

Encl

nuc

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**Navy review(s)
completed.**

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ARTICLE VIII

POSSIBLE INNOVATIONS ON THE JOHNSON SHARK DETERRENT SCREEN

-- OR --

"AN INTERESTING THING HAPPENED TO ME ON MY WAY TO ACDUTRA"

by LT David L. Harris, USNR-R

Knowing you'd be interested in a life preserver, shark deterrent, water collector, solar still, giant signaling mirror, radar reflector, stretcher, pup tent, poncho, and space blanket/sleeping bag all rolled up in a package approximately 6" x 7" x 2", weighing 2 - 4 pounds, I urge you to read on.

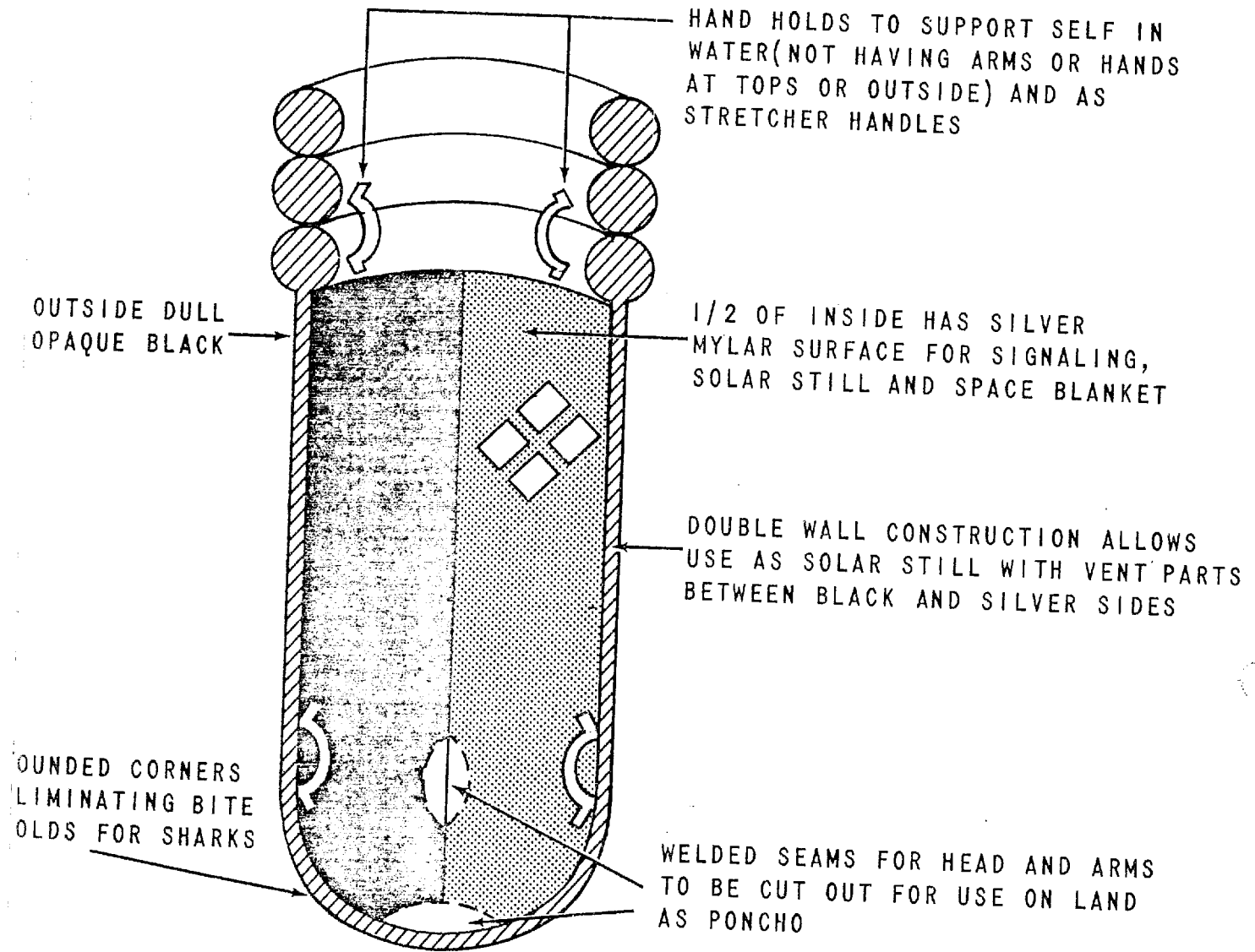
In late September and early October of 1971, I was fortunate enough to be assigned ACDUTRA aboard the USS CONSTELLATION (CVA 64) to conduct a survey of SERE knowledge and needs of the pilots and flight crews. Upon completion of my portion of that assignment, I embarked on an inventory of pertinent materials on survival and rescue aboard and continued it at FICPAC with LT Fred Rotzler.

The most interesting information I came across during this inventory had to do with a device known as the Johnson Shark Screen. Having been a sports diver for over 20 years, I've encountered sharks on at least eight occasions and have some knowledge and a lot of respect (not fear) for them.

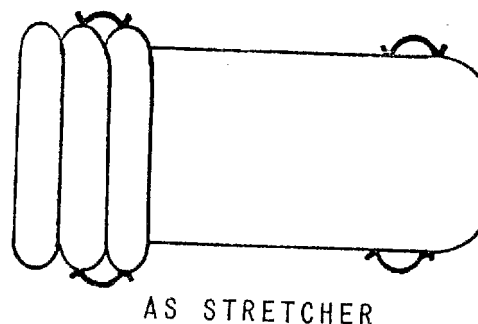
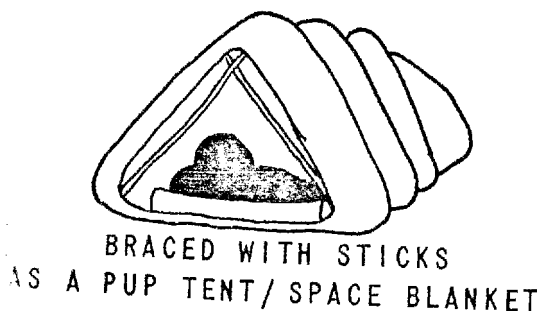
Dr. Albert Tester of the University of Hawaii first mentioned the Johnson Shark Screen to me about two years ago as a new device he was working with and the best solution thus far. Then in 1970, I was on the same college campus as Charles Daniels, who had worked with Dr. Tester here in Hawaii (with captive sharks) and later at Eniwetok Atoll with sharks in their open environment. From conversations with them and reading their study, I want to condense this information and pass it on to my fellow officers.

The plasticized bag was developed by Dr. C. Scott Johnson, U. S. Navy Marine Biology Facility, Point Mugu, California. It is designed to be filled with water and kept afloat by its three inflatable rings at the collar. In this manner, an individual is suspended and blood (from wounds) and other possible shark-attracting odors are not dispersed into the sea.

Tests were conducted to determine the reactions of captive and free-living sharks (of medium size 5 to 7 feet) to bags of varying sizes and colors and materials.



CROSS SECTIONAL VIEW



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When not motivated by food--small whole fish (smelt, butterfly fish) or pieces of cut fish (surgeon fish, eels, etc.)--both groups of sharks tended to avoid the bag. Only rarely were the free-living sharks seen to circle close enough to brush it. Even when motivated by the food, they did not attack the bag; but they did bump or brush against it. There was some slight damage at the bottom corners. I feel that seldom, if ever, would the surrounding waters contain this type of attracting bait. It does seem to point, however, to the need to round the base, much like a test tube, to eliminate a bite hold. (This was also recommended by Tester.)

While most tests were conducted with an empty bag, one test was conducted with a man inside in the presence of free-living sharks. Enticed by food, the sharks did not attack the bag. One grey shark brushed against it but the contact was not felt by the person inside the bag.

The strength of the material is of vital importance because a rip or hole not only allows odors and/or blood to enter the surrounding water, but also means the bag would go limp and be more prone to damage by possible shark contact.

During these tests, the smaller 24"-diameter bag was as effective as the 37"-diameter bag and is, of course, lighter and smaller for storage. The two sizes of bags should be checked out with larger sharks such as the 15' tiger shark and the 30' great white shark before accepting the above. (This, too, was recommended by Tester.)

Bag color seemed unimportant, while reflectivity was very important. Black opaque is recommended.

As I thought about the device, it seemed we might be inclined to have our arms or hands over the top to support our body so why not weld handles inside for this purpose; and as long as we're putting at the top, why not put two more at the bottom and if we needed a stretcher on shore it could be turned inside out and we would have one.

Once the bag is turned inside out, it can be used for a number of other purposes if it is slightly modified as follows:

1. By welding two seams 180° opposite each other and having one-half of the inside of the bag coated with silver reflective mylar, it would perform as a huge reflective mirror for signaling overhead aircraft during daylight hours. It would need testing to find out if it would satisfactorily perform at night, or any time, as a radar-reflecting device.

2. Still utilizing the half-black-half-silver interior, and making it double-wall construction, a few vents from one sealed chamber to the other and two valves, one for input of salt water and the second for discharge of condensation on the silver side, would allow the shark bag to be utilized as a solar still. Sea water can easily be put into the

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dark side of the bag and, positioned properly, should evaporate, pass through the vents at the top seam, and should condense on the silvered cold side of the bag.

3. An elliptical weld in the bottom of the bag approximately 12" long and 4" across to cut an opening for a man's head and two reinforced welds at the seams for arm openings, would allow one to remove the plastic inside the welded area and use the shark bag as a poncho/raincoat on land, still maintaining solar still capabilities.

4. The silverized mylar surface should act as a space blanket; and the opposite side of the bag is, of course, an excellent ground cover. Therefore, one should have a sleeping bag in this device.

5. Prior to any cuts being made or rolling up and securing the base if cuts had been made to effect a poncho, the Johnson Shark Screen could be placed in any area where there was fresh water running, such as off large leaves in the jungle, overhanging rocks, or wherever and function as a water collector.

6. With several supporting sticks at each end, it would be possible to use a larger diameter bag as a pup tent also.

7. The Johnson Shark Screen is, of course, primarily a shark deterrent; and it is conceivable that experimentation might be conducted with a teflon coating on the outside to minimize any friction with the shark's sandpaper-like skin; thereby cutting down on the possibility of damage due to the shark bumping or rubbing against the bag. This, plus the double-wall construction, should be more than adequate protection.

8. The three separately inflated collars at the top will also act as an additional life preserver to keep one afloat should some damage happen to the inflatable life vest the pilot or crew member was carrying.

Inasmuch as this device is pregnant with possibilities, I would strongly encourage anyone to submit further ideas on this and shark experiences to me since I would like to pursue this further. Send all replies in to improve an already valuable piece of experimental equipment to FICPAC.

